



ANYONE

ANYTIME



ANYTHING

ANYWHERE





RECOMMENDATION #1: The integral role aerospace plays in our economy, our security, our mobility, and our values makes global leadership in aviation and space a national imperative. Given the real and evolving challenges that confront our nation, government must commit to increased and sustained investment and must facilitate private investment in our national aerospace sector. The Commission therefore recommends that the United States boldly pioneer new frontiers in aerospace technology, commerce, and exploration.

Chapter 1

Vision: Anyone, Anything, Anywhere, Anytime

The 20th century was America’s century. Our nation thrived on previously unimagined advances in ground, air and space transportation, rapidly becoming the world’s leader in nearly every economic sector driven by the progress of science and technology. What future does the 21st century hold for us and for the world?

The Congress gave our Commission a broad mandate to study the health of the aerospace industry and to identify actions that the United States needs to take to ensure its health in the future. The challenge of looking across military, civil and commercial aspects of aviation and space was an opportunity to take an integrated view of the aerospace sector – government, industry, labor and academia.

The Commissioners represent a broad cross section of the stakeholders responsible for the health of the industry and whose expertise represents the breadth and depth of aerospace issues. Drawing on their extensive experience, and on the hundreds of

briefings and public testimony, the Commission has made nine recommendations—one per chapter—that provide our guidance to the nation’s leaders on the future of the U.S. aerospace industry. The size and scope of this report reflects an industry that is complex and interdependent.

From the big picture we describe, the Commission encourages the reader to recognize the importance of the aerospace industry to America, and to build the consensus we need for action.

“It is scarcely possible that the twentieth century will witness improvements in transportation that will be as great as were those in the nineteenth century.”

Brooklyn Daily Eagle,
December 30, 1900

Aerospace is Vital to the United States

One hundred years ago, the slogan “Anyone, Anything, Anywhere, Anytime” would have meant leaving home when transportation permitted and then allowing nearly a week to travel between widely separated American cities.

Today, New York to London is a day trip. A package of any size mailed tonight arrives tomorrow morning anywhere in the country. We fly across the world on a moment’s notice, at an altitude of 41,000 feet, on an airplane that holds 400 people, getting fed in our seats, while watching feature-length movies, calling home or checking our e-mail. When we arrive at our destination, our biggest complaint may be the delays encountered getting to, from and through the airports.

As America prepares to celebrate the 100th anniversary of the Wright brothers’ historic achievement in aviation, our Commission was struck with how the U.S. aerospace industry has shaped the 20th century not only for America but also for the world. Indeed, U.S. leadership has been responsible for superior achievement in many important industries, but aerospace has been our crown jewel.

Our national security, economic growth, quality of life, and scientific achievements now depend on a myriad of aerospace products and services. These benefits we enjoy as a nation are the direct result of U.S. leadership in aerospace. Unfortunately, most Americans take the benefits of aerospace leadership for granted. Meanwhile, foreign nations clearly recognize the potential benefits from aerospace and are attempting to wrest global leadership away from us.

Nevertheless, where we have the national will, such as in defense, we continue to be the world leader. Where we do not have the national will, such as in civil aviation and commercial space, our leadership position is at risk.

National Security. Aerospace technologies form the strategic and tactical backbone of U.S. military capabilities, providing global mobility, space-based communications and intelligence, defense against

THE AEROSPACE SECTOR MISSION

- Develop, manufacture and/or operate systems used in the earth’s atmosphere and/or in space;
- Provide services in and from the earth’s atmosphere and/or space; and
- Provide the workforce and infrastructure and perform the research needed to develop and support the systems and services.

airborne threats, sea and aerospace control, long-range precision strike, and protection and tactical mobility for ground forces. Aerospace capabilities provide unique contributions to U.S. national security as well as underwrite the capabilities of allied coalitions with whom we are involved in the vital work of maintaining international peace and security.

Economic Growth. The aerospace industry is a powerful force within the U.S. economy and one of the nation’s most competitive sectors in the global marketplace. It contributes over 15 percent to our Gross Domestic Product and supports over 15 million high quality American jobs. Aerospace products provide the largest trade surplus of any manufacturing sector. Last year, more than 600 million passengers relied on U.S. commercial air transportation and over 150 million people were transported on general aviation aircraft. Over 40 percent of the value of U.S. freight is transported by air. Aerospace capabilities have enabled e-commerce to flourish with overnight mail and parcel delivery, and just-in-time manufacturing.

Quality of Life. Aerospace products and services are important contributors to both the business sector and the quality of life of the American public. Air travel is the fastest and safest form of personal and business mobility. Personal travel now accounts for more than 50 percent of air transportation and is increasingly accessible to all segments of American society. The public continues to benefit immeasurably from aerospace applications, including improved weather forecasting, cellular telephones,

precision farming, new medical devices, and hundreds of other benefits.

Scientific Achievement. Ongoing scientific discoveries have not only enabled the preceding benefits but have also provided fundamental knowledge of our planet, the universe, and the origins of life itself. Space-based observatories, such as the Hubble telescope, enable us to look back in time to the creation of the universe. The International Space Station is the first step toward permanent international colonization of outer space. Interpretation of climate change, and new discoveries about the formation and evolution of our solar system now have practical relevance and are essential elements of the nation's political, cultural, and scientific agenda.

Government, Industry, Labor and Academia Each Play an Important Role

There are four major stakeholder groups that play important roles in the aerospace sector—government (at all levels), industry, labor, and academia. In performing these roles, they contribute to the three major segments of aerospace—national security (defense and intelligence), civil (other government) and commercial. Each segment has air, ground and space components. All of the stakeholders need to work together in partnership to deliver quality aerospace products and services to the American people.

For example, in the area of air transportation, the Federal Aviation Administration (FAA) in the U.S. Department of Transportation (DOT) develops and operates the nation's civil air traffic control system for military, civil and commercial aircraft operating in domestic and oceanic airspace. That system depends on the military's Global Positioning System for navigation information and air- and space-based sensors for surveillance information. It uses military, civil and commercial communications for ground-to-air and air-to-ground communications. Local airport authorities build and operate the airports; while aircraft and

Unfortunately, most Americans take the benefits of aerospace leadership for granted.

SEGMENTS OF THE AEROSPACE SECTOR

- National Security
 - Defense
 - Air (e.g., combat aircraft, airlift, unmanned aerial vehicles, guided missiles)
 - Space (e.g., space launch, communications, navigation and reconnaissance satellites)
 - Intelligence (e.g., air and space-based communications, reconnaissance)
- Civil (other government)
 - Air (e.g., air traffic management system, safety regulation, accident investigation, environmental permitting, noise and emission standards)
 - Space (e.g., weather satellites, air- and space-based earth monitoring, International Space Station, Space Shuttle, Hubble Space Telescope, robotic missions to the planets)
- Commercial
 - Air (e.g., aircraft manufacturing, air carriers, general aviation, airport operations)
 - Space (e.g., space launch, launch vehicles and satellite manufacturing, telecommunications, remote sensing)

airport security is provided by DOT's Transportation Security Administration.

The FAA also regulates and certifies civil and commercial aircraft safety and works with the Department of Defense to provide the air traffic controllers that manage the nation's air traffic control system. The Environmental Protection Agency regulates the environmental permitting of new runway construction.

The Departments of State, Commerce and Transportation negotiate international aviation agreements, standards and regulations. The National Aeronautics and Space Administration develops

technology to improve aviation safety and reduce environmental impacts as well as develop tools for improving the air traffic control system. It also invests in long-term aerospace research and development for the commercial aerospace industry.

The commercial sector develops and manufactures the equipment used in the aircraft as well as the ground, air and space systems used in the air transportation management system. The commercial sector also manufactures the aircraft and operates the airlines that transport the public, business passengers and goods—both domestically and abroad.

As this example illustrates, a vast array of organizations make up the aerospace sector, including: federal, state and local government organizations; multi-national corporations, suppliers and small businesses; labor unions and trade schools; colleges and universities; professional associations and societies; and non-governmental organizations. The government (military and civil) and the commercial sector need to work together to provide the nation with safe and secure air transportation anywhere in the world.

In addition, the aerospace sector generates a wide range of jobs across the fabric of the American economy. This includes jobs in: runway and airport construction; ground transportation; retail stores and restaurants at airports; and agricultural, urban planning and weather services.

The World is Changing Rapidly

The Commission has identified a number of forces that are changing the world and the aerospace sector. Among these changes are significant shifts in the global threat, mobility and environmental awareness, economic growth, governance, and technology. Understanding these changes is critical if the United States is to move forward in the second hundred years of human flight and sustain its global aerospace leadership position.

Looking ahead, U.S. dependence on new aerospace capabilities and technologies will only continue to

FORCES OF CHANGE ON AEROSPACE

HISTORIC	EMERGING
Super Power Threat	Terrorism Threat
Explosives	Cyber, Chemical, Bio
Vehicle Centric	Network Centric
Foreign Adversaries	International Partners & Competitors
Hub and Spoke	Point-to-Point
Airlines	Range of Air Vehicles
Human Control	Human Oversight
System-by-System	System-of-Systems
Prescriptive Specifications	Performance-based Solutions and Regulations
Local & Regional	National & Global Markets
U.S. Companies	Multi-national Corporations
Predominantly White Male Workforce	Diverse Workforce
Large Physical Infrastructure	Virtual & Flexible
Mass Production	Custom Built Atom-by-Atom

grow. Military priorities include defense against ballistic missiles, more rapid global power projection, and more emphasis on aerospace-based communications, intelligence, surveillance, and reconnaissance, among others. Civil priorities include more effective and efficient air traffic management, advanced navigation aids, and other infrastructure needs. Space will open up new opportunities for expanding human presence in the solar system and enriching life on earth through its exploitation in such areas as energy and materials.

How the United States addresses these military, civil and commercial priorities will significantly impact the American economy as well as our national security posture.

U.S. Aerospace Global Leadership is in Jeopardy

Our Commission has met with many organizations—both foreign and domestic—over the past year. We have gathered information on the health and future of the aerospace industry, at home and abroad. Based on this, we believe that U.S. aerospace leadership is in jeopardy. Here is what we see:

At Home. The U.S. aerospace sector, most notably the commercial air sector, is seen increasingly as a mature industry lacking in capital investment, innovation, and capacity for growth. Aerospace sector market capitalization, research and development investments and return on investments/assets are down and consolidations are up. The U.S. is losing global market share and its positive balance of trade in aerospace manufacturing is eroding. Jobs are going overseas.

The U.S. economic downturn, coupled with the additional security costs resulting from the September 11 terrorist attacks, is crippling the airlines and causing massive layoffs. Meanwhile, today's air transportation system—based on 1960s technology and operational concepts—is reaching capacity, resulting in increasing delays and costs for both passengers and shippers.

At the same time, government investments in long-term civil aerospace research are static, if not declining in real terms. The lack of sustained, long-term investment is stifling innovation and preventing the establishment of new economic growth curves for air transportation and space. While the military has recently received significant increases, both in research and development and in procurement accounts, those increases focus on near-term counter-terrorism and homeland security problems and may be short-lived. The aerospace workforce and infrastructure are aging, and there is a lack of compelling vision or robust financial outlook to draw our youth into this important business sector.

We believe that U.S. aerospace leadership is in jeopardy.

Abroad. Around the world, foreign competitors are aggressively implementing policies to take global aerospace leadership away from the United States. The European Union has a stated policy objective of being the world's leader in aerospace by 2020. Asian nations are aggressively trying to capture the U.S. systems engineering and integration expertise needed to develop state-of-the-art aerospace systems. The international competition continues to gain global market share in commercial aviation. Often desirable, but ever-tightening environmental requirements on noise and emissions are limiting worldwide flight operations and creating international conflict. And, in spite of excess capacity and low demand for space launch capabilities, foreign governments continue to subsidize their commercial space launch industry.

The Commission finds this situation unacceptable.

A Vision for America

What could “Anyone, Anything, Anywhere, Anytime” mean a century from now? A one-hour sub-orbital trip from the United States to Japan? A lunar vacation? A Martian hiking expedition? Whatever our future holds, the aerospace sector will be at its foundation, providing our nation and the world with the ability to move people, goods, services and ideas whenever they are needed and wherever they are wanted.

Unfortunately, the nation has not articulated a compelling aerospace vision for over forty years—nor since 1961, when President Kennedy challenged the nation to put humans on the Moon and to bring them back safely before the end of the decade. Although spurred by the Cold War and early successes by the Soviet Union in space, the Apollo program transformed America into a space-faring nation, while establishing us as the global aerospace leader. The human space flight program, with each mission more ambitious than the last, further motivated an entire generation of the nation's best and brightest students to pursue careers in science and engineering.

As we now coast on investments made by the generations that came before us, the technological and economic preeminence we have taken for granted is in jeopardy. Based largely on perspectives and expectations borne of the Apollo era, Americans commonly view aerospace as the highest of high-tech industries. Aerospace was the unique purview of the advanced society that is America. Today, however, aerospace and other high-tech industries flourish globally, offering strong and unprecedented international competition in these sectors.

The time is now to shape a bold new aerospace vision for this century that does not leave us wondering whether the 20th century saw the ultimate advances in mobility. In particular, the nation faces a new imperative for which the aerospace industry is uniquely positioned to shine: America and its allies must win the war against terrorism while taking aggressive measures to strengthen our economy and improve the quality of life for all Americans.

The nation needs to build on the vision that President Eisenhower had in 1956 of an interstate highway system, which transformed America into a mobile society. Now is the time to provide that same mobility to all Americans in the air and in space.

We need a bold vision for air transportation that creates a new, highly automated “Interstate Skyway System.” The system needs to be safe, secure and efficient and be able to accommodate the large volume and variety of civil and military aerospace vehicles the nation will require in the coming decades.

We also need an audacious vision of space exploration that recognizes the solar system as our backyard, the Milky Way galaxy as our neighborhood, and the universe as our hometown. We should do this not simply because it is fun, or thrilling, or challenging, or enlightening... but because it, too, represents an efficient investment in our economic strength and, ultimately, in our capacity to defend ourselves against enemies known and unforeseen.

It’s America’s choice.

The vision that aerospace offers America and the world is:

Anyone, Anything, Anywhere, Anytime

Just as the Wright brothers’ historic flight in December 1903 set the course for U.S. global aerospace leadership in the 20th century, the Commission believes that its national vision for aerospace—Anyone, Anything, Anywhere, Anytime—will help sustain our leadership in the 21st century. If we value technologically-driven prosperity, and if we value security in times of need, and if we do not want the 20th century to fade as a distant memory of America’s greatness, then this vision will:

- Provide a new era of fast, efficient, global air mobility;
- Enhance our homeland and international security;
- Enable a new era of scientific discovery and space exploration;
- Open new markets and high-paying jobs for Americans; and
- Enable technology applications that spread across the entire economy.

Sustaining Our Global Leadership

Sustaining U.S. aerospace sector leadership needs to be a national priority. Today, the nation is responding to a national imperative similar to winning the Cold War—winning the war against terrorism while strengthening our global economic leadership. Aerospace will play a pivotal role in our ability to respond to this imperative, but the nation needs to unleash its full potential.

Now is the time for the aerospace sector—government, industry, labor and academia—to come together to address these critical issues, remove the bureaucratic and other impediments to progress that have long since outlived their usefulness, and embrace our vision for aerospace in the 21st century. This vision will help set and prioritize national

goals—goals that would help to focus both public and private sector investments and rekindle the flame of innovation and determination that once drove the U.S. to develop the interstate highway system and to leave American footprints on the surface of the moon.

Conclusions

To achieve our vision for aerospace, the Commission concludes that:

- The nation needs a national aerospace policy;
- There needs to be a government-wide framework that implements this policy;
- The Administration and Congress need to remove prohibitive legal and regulatory barriers that impede this sector's growth and continually seek to level the international playing field; and
- Global U.S. aerospace leadership can only be achieved through investments in our future, including our industrial base, workforce, long-term research and national infrastructure.

RECOMMENDATION #1

The integral role aerospace plays in our economy, our security, our mobility, and our values makes global leadership in aviation and space a national imperative. Given the real and evolving challenges that confront our nation, government must commit to increased and sustained investment and must facilitate private investment in our national aerospace sector. The Commission therefore recommends that the United States boldly pioneer new frontiers in aerospace technology, commerce, and exploration.